

Bitter

Bitter Overview

Volunteer monitoring began at Bitter Lake in the 1980s and has continued from 1997 through 2004. The collected data categorize this lake in the city of Seattle as moderate in primary productivity (mesotrophic), with good water quality, remaining stable over time.

Bitter Lake has no public access boat ramp, but car top boats can be launched through the city park. Residents should monitor aquatic plants growing nearshore to catch early infestations of Eurasian milfoil, Brazilian elodea, or other noxious aquatic weeds.

Lake Temp, Secchi Depth, Lake Level and Precip

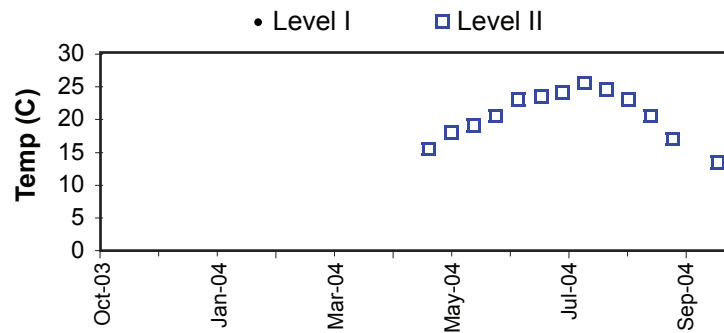
Secchi transparency ranged between 2.0 and 4.0 m from May through October, averaging 3.0 m which placed it mid range for the lakes monitored in 2004. Surface water temperatures were in the upper mid range for the group, reaching a maximum of 25.5 degrees Celsius.

No water levels or precipitation were recorded for the year.

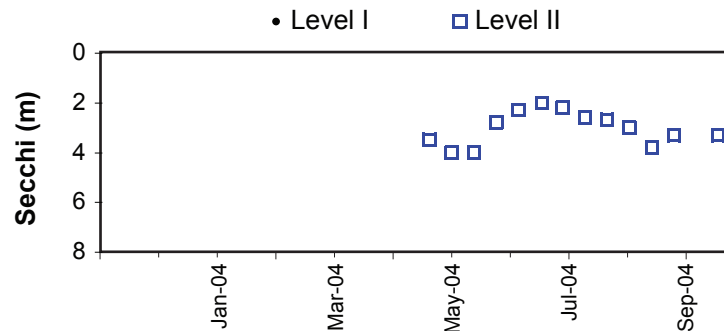
Nutrient Analysis and TSI Ratings

Total phosphorus and nitrogen remained in fairly constant proportion to each other until late October when phosphorus increased more rapidly than nitrogen. Their ratio ranged from 13 to 41, averaging 28, with most values above 20, signifying relatively poor conditions for nuisance bluegreen growth.

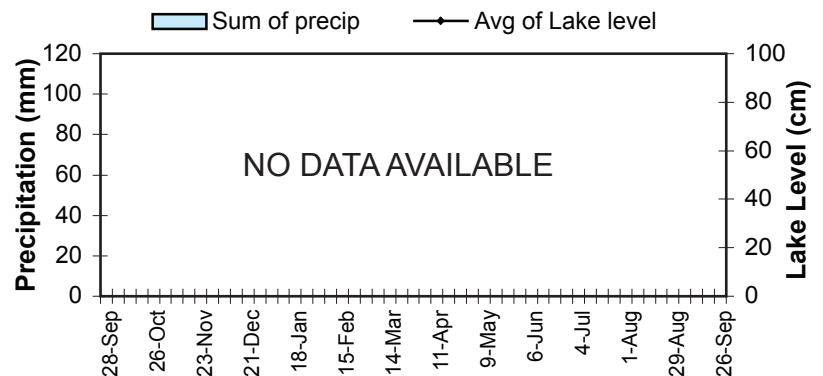
Lake Temperature



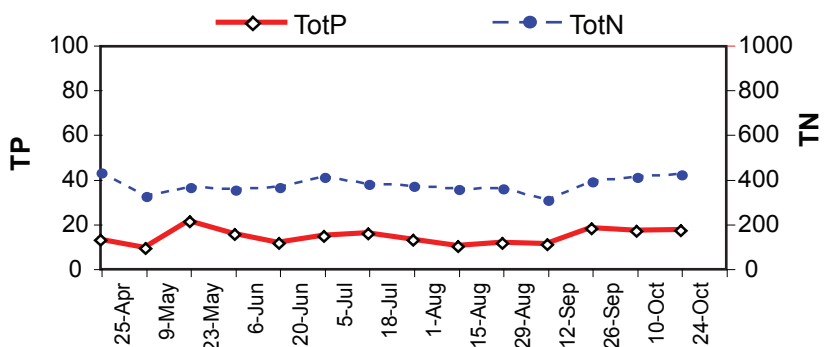
Secchi Depth



Lake Level and Precipitation



Nutrient Analysis



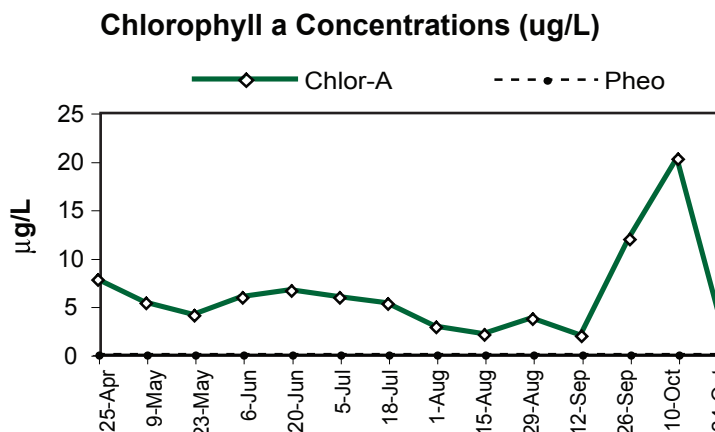
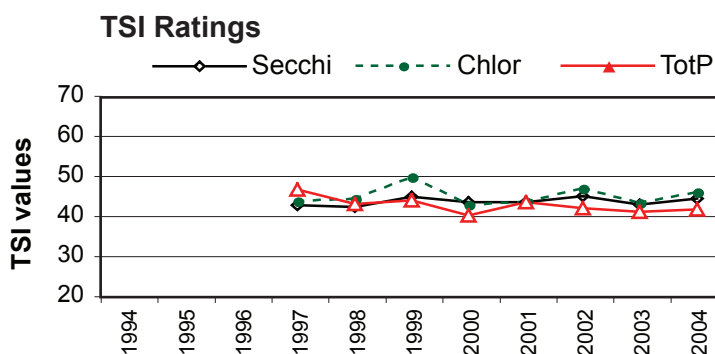
Profile data indicate that thermal stratification was present, but probably not very strongly maintained. There was little phosphorus build-up in the deep water through the summer. Chlorophyll concentrations were highest in the deep water on both dates, suggesting the majority of the algae were to be found in deep water.

TSI values for the three indicators were close to each other in 2004 and were well within the mesotrophic range, similar to previous years. The lake appears to have been relatively stable over the years of monitoring.

Chlorophyll Concentrations and Algae

Chlorophyll content decreased slowly after the first sample date, then reached a major peak in mid-October characterized by the chrysophyte *Dinobryon*. Other common algae present through the sampling season included the chrysophytes *Gloeobotrys* and an unidentified species, the euglenophyte *Trachelomonas* and the several species of chlorophytes. Bluegreen algae were found only rarely in the samples.

Date	Secchi	depth-m	degC	Chlor-A	TP µg/L	TN µg/L
5/23/04	4.0	1	19.0	4.01	20.7	365
		4	17.0	7.21	13.3	329
		7	10.0	27.00	34.6	617
8/29/04	3.0	1	23.0	3.70	11.0	358
		4	22.0	4.70	12.4	368
		6.5	18.5	7.70	14.3	373



Common Algae

	Group
<i>Gloeobotrys</i> sp.	Chrysophyta
<i>Dinobryon cylindricum</i>	Chrysophyta
unident. green colony	Chlorophyta

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2004 Level I Data not available

2004 Level II Data

Date (2004)	Temp (°C)	Secchi (m)	Chl-a (µg/l)	TP (µg/l)	TN (µg/l)	Algae Obsv.	N:P	Calculated TSI		
								Secc	chl-a	TP
25-Apr	15.5	3.5	7.69	12.6	430		34	41.9	50.6	40.7
9-May	18.0	4.0	5.29	8.7	325		37	40.0	46.9	35.4
23-May	19.0	4.0	4.01	20.7	365		18	40.0	44.2	47.9
6-Jun	20.5	2.8	5.85	15.1	352		23	45.1	47.9	43.3
20-Jun	23.0	2.3	6.57	11.1	364		33	48.0	49.0	38.9
5-Jul	23.5	2.0	5.87	14.2	409		29	50.0	47.9	42.4
18-Jul	24.0	2.2	5.21	15.5	379		24	48.6	46.8	43.7
1-Aug	25.5	2.6	2.80	12.5	371		30	46.2	40.7	40.6
15-Aug	24.5	2.7	2.08	9.8	356		36	45.7	37.8	37.1
29-Aug	23.0	3.0	3.70	11.0	358		33	44.1	43.4	38.7
12-Sep	20.5	3.8	1.92	10.4	307		30	40.7	37.0	37.9
26-Sep	17.0	3.3	11.90	17.7	389		22	42.8	54.9	45.6
10-Oct	NR	NR	20.20	16.6	411		25		60.1	44.7
24-Oct	13.5	3.3	1.60	16.8	421		25	42.8	35.2	44.9
	Temp (°C)	Secchi (m)	Chl-a (µg/l)	TP (µg/l)	TN (µg/l)	Algae	N:P	Calculated TSI		
								Secc	chl-a	TP
Mean	20.6	3.0	6.0	13.8	374.1		28	44.3	45.9	41.5
Median	20.5	3.0	5.3	13.4	368.0		29	44.1	46.8	41.6
Min	13.5	2.0	1.6	8.7	307.0		18	40.0	35.2	35.4
Max	25.5	4.0	20.2	20.7	430.0		37	50.0	60.1	47.9
Count	13	13	14	14	14		14	13	14	14

TSI Average = 43.9